

feet,* and he adds that even if the diminution of the increase of heat with depth took place at the rate of only $1\frac{1}{10}^{\circ}$ R. instead of $1\frac{3}{10}^{\circ}$ R., the region of constant temperature would be reached at 13,500 feet.

A similar diminution of the increase of heat with depth was observed in the case of the boring at Grenelle; but here the depth reached was far less, and the diverse character of the rocks passed through caused doubts to be entertained as to the accuracy of the result.†

In these results Prof. Mohr finds a strong confirmation of all the objections that have been urged from other sides against the Plutonistic theory. "The cause of the increasing heat in the interior of the earth," he says, "must lie in the upper strata of the earth's crust. . . . The theory of volcanoes must of course adapt itself to the above results, and the fluidity of the lavas is not a part of the incandescence (no longer) present in the earth, but a local evolution of heat by sinkings which have always been produced by the sea and its action upon solid rocks, as indeed all volcanoes are situated in or near the sea. This local superheating of the volcanic foci contributes greatly to the internal heat of the earth. For the internal nucleus of the earth can lose but little heat outwards on account of the bad conductivity of the siliceous and calcareous rocks, whilst, in the lapse of ages, it must propagate uniformly all the heat-effects of the volcanoes, and thus a constant elevated temperature must prevail in the interior, and therefore we come to the conclusion that increase of heat in the interior of the earth which is everywhere met with is the result of all preceding heat-actions, uniformly diffused by conduction in the internal nucleus of the earth." Further causes of terrestrial heat are, according to Prof. Mohr, the formation of new crystalline rocks from sun-warmed, infiltrated fluids, and also chemical processes such as the evolution of carbonic acid by the contact of oxide of iron with the remains of organisms, the formation of pyrites and blends by the reduction of sulphates in contact with organic matters, the decomposition of lignite and coal, &c.

SCIENTIFIC SERIALS

THE *Journal of Anatomy and Physiology*, which in future will appear quarterly instead of twice a year, and has two additional editors, both physiologists, Dr. Foster and Dr. Rutherford, contains several important memoirs. The first is by Mr. Frank Darwin, on the primary vascular dilatation in acute inflammation, in which, from a study of the effect of irritants on the web of the frog's foot, he concludes, in opposition to Cohnheim, and in accordance with Schiff, that local irritants produce these effects on vessels by acting on the peripheral terminations of the vaso-motor nerves; that they do not cause dilatation by direct paralysis of the tissues of the arteries, and that when the vaso-motor nerves include both inhibitory and constrictor fibres, both are stimulated by them, the attendant alteration in the calibre of the vessel being the result of the victory of the one set over the other.—Mr. F. M. Balfour has an important article on the origin and history of the urinogenital organs of Vertebrates, in which the independent discovery by Semper and himself of the segmental-organ condition of the primitive Wolffian bodies and kidneys in Elasmobranchiata is fully described, and the mode of development of the Mullerian duct explained. The way in which the segmental organs, opening externally in Annelids, have a ductal termination in Vertebrates is discussed. It is analogous to the manner in which the gill-sacs of Petromyzon, opening externally; those of Myxine have a single external orifice. The paper deserves careful perusal.—Dr. Ogston writes on articular cartilage, and illustrates his observations with six plates. After a description of healthy cartilage, the changes developed in serofulous arthritis and chronic rheumatoid arthritis are discussed. The paper is more pathological than physiological.—Mr. W. H. Jackson and Mr. W. B. Clarke describe elaborately the brain and cranial nerves of the Shark *Echinorhinus spinosus*, from two specimens transmitted from Penzance to the Oxford Museum, to which are appended accounts of the digestive and urogenital organs.—Mr. J. Priestley demonstrates that the so-called corneal cells described by Dr. Thin as being brought into view by the action of saturated caustic potash solution at 110° F. are, in reality, those of the corneal epithelium.—Mr. E. C.

* In this calculation Prof. Mohr seems to have made a slight slip. If the increase of heat diminishes at the rate of 0.05° R. per 100 feet, it is hard to see why strata of 200 feet should be taken as the units in the calculation. Taking 100 feet as the unit of space, the zero point should be reached at 4280 feet.

† See Vogt's "Lehrbuch der Geologie," Bd. I. p. 29.

Baber repeats Tillmann's observations on the fibrillar nature of the matrix of hyaline cartilage, confirming them, but differing as to the reagents which best demonstrate them.—Prof. Turner has an important memoir on the structure of the diffused, the polycotyledonary, and the zonary forms of placenta, which contains the substance of his course of lectures on that subject at the Royal College of Surgeons last summer.—Prof. Rutherford replies to Mr. Lawson Tait's comments on his freezing microtome, satisfactorily demonstrating the value of the instrument.—Dr. Stirling describes his way of preparing skin for histological examination by the rather crude method of partial artificial digestion.—Finally, Mr. J. N. Langley writes on the action of Jaborandi on the heart, discussing its slowing action, which he was the first to determine.—Dr. Stirling's Report on Physiology concludes the number.

THE current number of the *Quarterly Journal of Microscopical Science* commences with an illustrated memoir, by Mr. D. J. Hamilton, "On Myelitis, being an experimental inquiry into the pathological appearances of the same," in which the effect of traumatic injury of the cord is investigated microscopically.—The second paper is an abridged translation by Dr. W. R. M'Nab, of a paper by Dr. Oscar Brefeld, from his "Botanische Untersuchungen über Schimmelpilze," Heft. II., on the life-history of *Penicillium*.—This is followed by an article "On the Resting-Spores of *Peronospora infestans*, Mont, by Mr. Worthington Smith, with photographic illustrations.—After this Dr. Klein describes the Structure of the Spleen. He finds "that the pulp of the spleen of the rat and the cat is similar to that of the dog, whereas that of the monkey is similar to that of man; also that in the pulp the matrix, instead of being composed of fine fibres, has the appearance of honey-combed membranes, which only when seen in profile have the appearance of fibres. All the author's observations support the view of the splenic circulation adopted by W. Müller, Frey, and others, that the venous radicles represent merely a labyrinth of spaces in the splenic parenchyma. He agrees with those who find that there is a gradual passage from the matrix of the pulp to that of the adenoid tissue of the arterial sheaths and the Malpighian corpuscles.—Mr. C. H. Golding-Bird describes a simple differential warm stage by which a fairly uniform temperature may be maintained for a long time. To the central copper stage proper are fixed a tongue of copper and an iron wire, round both of which, for part of their extent, bell-wire is wound.—Mr. W. H. Poole describes the effect of the double-staining of tissues with hæmatoxylin and aniline. The nuclei stained by hæmatoxylin are made of a richer colour by the second reagent, whilst the protoplasm surrounding them is much bluer than the nuclei themselves.—Mr. J. M'Carthy makes some remarks on Spinal Ganglia and Nerve-fibres.—Dr. Klein has a note on a Pink-coloured *Spirillum* (*Spirillum rosaceum*).—The last paper is by Mr. Frank Darwin, on the Structure of the Proboscis of *Ophideres fulonica*, an orange-sucking moth, in which the peculiar conformation of the apex of that organ is described and figured, as is the interlocking of the two halves of its component maxillæ.—Notes, chronicle, and proceedings of Societies complete the number.

THE *Transactions of the Linnæan Society of London* will in future be published, like the *Journal*, in two series, Zoological and Botanical. Three parts have recently been issued. The third and concluding part of vol. xxix. completes the account of the Botany of the Speke and Grant Expedition, by Prof. Oliver and Mr. J. G. Baker, and is illustrated by sixty-four plates, making 136 for the whole volume. The first part of the first volume of the second series (Zoology) includes Mr. W. K. Parker's paper On the Skull of the Woodpeckers; Dr. Willemoes-Suhm's, On the Crustacea of the *Challenger* Expedition; and Prof. Allman's, On the structure and systematic position of *Stephanoscyphus mirabilis*, the type of a new order of Hydrozoa; and the first part of the new Botanical series is occupied by Mr. Miers's papers on *Napoleona*, *Omphalocarpum*, *Asteranthos*, and on the Auxemnee. An account of all these papers was given at the time of their delivery before the Society.

THE *Geological Magazine*, Nos. 133, 134, 135.—The principal original articles are instalments of long articles on volcanoes, by Mr. Judd; on *Cretaceous aperrhaidæ*, by Mr. Starkie Gardner; on meteorites, by Dr. Walter Flight. Carl Pettersen contributes a sketch of the geology of Northern Norway, in No. 135. A list of previous writers is given. Five groups of stratified rocks are recognised: 1. The primitive; 2. The Troms mica slate group, probably the equivalent of the Cambrian; 3. Slates

of Balsford, age very uncertain, perhaps late Cambrian; 4. Alten group, regarded as Silurian; 5. Gorda group, Devonian. The groups of the Secondary period are quite unrepresented. Throughout the Quaternary period the land has been subjected to an upheaving of about 120 metres, and this elevation has been continued down to the historic time. As to whether the land is still rising, there is no positive evidence existing. In any case it is certain the elevation during the last thousand years has been insignificant. When it is stated in so many quarters as a geological fact that the northern part of Norway rises about one-third of a metre in a century, this rate is evidently much too great. The unstratified rocks met with are also described. To No. 135 there is a supplement of forty-four pages, containing a report with plates of Mr. Tylor's lecture to the Geologists' Association on denuding agencies.

THE *Proceedings of the Natural History Society of Glasgow*, vol. ii. Part I. contains among the most interesting of its articles a paper by Mr. John A. Harvie Brown on the birds found breeding in Sutherlandshire, and another by the same author in conjunction with Mr. E. R. Alston, F.Z.S., on the mammals and reptiles of the same county. These form an excellent addition to Mr. Selby's on the same subjects.—Mr. J. Gilmour writes on the introduction of the Wild Turkey (*Meleagris gallopavo*) into Argyllshire; as does Mr. D. Robertson on the Sea Anemonies of the shores of the Cumbraes, &c.—Mr. J. Coutts describes the post-tertiary clay-beds at Kilchattan Bay, Isle of Bute.—Mr. R. Gray notes points in the distribution of the Capercaillie in Scotland; on the occurrence of the Crane in Rosshire; on the Wood Pigeon, &c.—Lord Binning gives notes on the food of the Wood Pigeon.—Capt. H. W. Fielden, now naturalist to the Arctic Expedition, writes on the Gaur or Indian Bison, and gives notes on a tour through the Outer Hebrides.—Mr. J. S. Dixon gives notes on the discovery of an ancient canoe at Little Hill, Cadder Moor.—Dr. Grieve records dredging notes from the Bay of Rothesay.—There are other short papers by Mr. W. Galt, Mr. J. Young, Dr. D. Dewar, Prof. A. Dickinson, Mr. J. Ramsey, Mr. D. Robertson, Rev. J. L. Somerville, &c.

Zeitschrift der Oesterreichischen Gesellschaft für Meteorologie, Sept. 1.—Mr. Blanford's researches on solar radiation and spots, described in a former number of NATURE, form the subject of the first paper.—In the concluding part of Dr. Theorell's description of his printing meteorograph, he states that, with certain precautions, the instrument may be kept for a long period in good working order. One has been in use at Upsala during the last three years and a half, and has lost nothing of its original precision. In a note appended to the inventor's description, Herr Osnaghi mentions some alterations which have been made in the Vienna instrument; thus the power to register great velocities of wind, in which it was formerly wanting, has been conferred upon it. Since the completion of these alterations the meteorograph has worked constantly and regularly.—In the "Kleinere Mittheilungen" we have an interesting extract from a letter written by Director Hoffmeyer, on the causes of the cold weather in May 1874. Up to the 21st of the month the synoptic charts show a maximum of pressure over N.W. and W. Europe, stretching like a great screen between the Atlantic and Central Europe, from Spitzbergen almost to Algiers, the minima coming partly from the Arctic seas, partly from the Western Mediterranean, with gradients steep towards N. and W. Such a distribution of pressure must give rise to a cold Polar stream flowing over the greater part of Europe. In Vienna the cold was greatest between the 16th and the 18th, and then the high pressure began to travel eastwards. This movement of the maximum produced a great change. The Atlantic minima, instead of moving northwards along the west coast of Greenland as hitherto, now pressed eastwards, reached Iceland and the Azores, and soon the pressure was lowest in the very district where a few days before the maximum existed. At the same time temperature rises in Central Europe. In June a similar succession of barometric changes occurred, and the maximum of pressure in the N. W. was again attended with cold at Vienna. Herr Hoffmeyer observes that areas of high pressure are much more quiet and longer lasting than minima, which travel rapidly, change their shapes, and throw off secondary disturbances. He thinks the present system of averages insufficient for the purposes of generalisation, and regards the researches of Köppen on the properties of winds in different conditions of atmospheric distribution as a step in the right direction.

THE July number of the *Bulletin Mensuel de la Société d'Accli-*

matation de Paris, which is always more than a month behind date, opens with the Secretary's Annual Report on the proceedings of the Society in 1874.—Special attention has been given to the training of wild animals, such as zebras, for domestic purposes, and to the breeding of hybrids, such as those between the horse and zebra, ass and zebra, &c. Complete success is said to have attended the attempts to tame the zebras in the Gardens of the Society. The efforts of the Society are largely assisted by the experiments carried out by such gentlemen as M. Cornély, M. Mairé, M. Moreau, and others, who have succeeded in rearing many of the rarer forms of foreign animal life, and useful plants.—New Caledonia is the subject of a lengthy paper by M. Germain, who considers that that country would easily support many useful animals which do not exist there. By their introduction the country would be greatly benefited, while its importance would also be increased by additional facilities being given for utilising its indigenous produce. It is peculiarly rich in timber, which affords shelter to many kinds of useful birds.—The cultivation of the Alfa Plant (*Stipa tenacissima*), which grows wild in Algeria, is strongly recommended in the South of France, where there are large tracts of land well suited to its growth.—The cultivation of new varieties of silkworms is steadily progressing in France, and the improved breeds which have been introduced have greatly assisted in remedying the evils of the silkworm disease.

THE *Schriften der Naturforschenden Gesellschaft in Danzig* (vol. iii. heft 3).—From this publication we notice the following papers:—Researches on the Prehistoric Times of West Prussia, by Dr. Lissauer.—On the Petrefacts found in the Diluvial Deposits near Danzig, by Herr Conventz.—On the Culture of the Caterpillars of *Gastropacha pini*, by G. Brischke.—On a Humming *Acilius sulcatus*, by the same.—Report on the investigations of Antiquities made in the neighbourhood of Neustettin during 1873, by Major Kasiski.—On the Spiders of Prussia, (seventh treatise), by A. Menge, with tables. This paper is the most valuable one in the publication, and gives proof of the wonderful diligence and energy of its author.

La Belgique Horticole, September and October.—In the current number of this magazine, usually devoted almost entirely to horticulture, are several articles of more than common interest. The paper of De Candolle is reprinted entire which has attracted a good deal of attention, on the different effects on the growth of the same species of the same temperature in different latitudes. Prof. E. Morren, the editor, has two articles on the "carnivorous" habits of *Pinguicula* and *Drosera*. Following Mr. Darwin's lead in a careful series of experiments on two Alpine species of the former genus, *P. alpina* and *longifolia*, and the common *D. rotundifolia* of the latter genus, he finds the same results as regards the secretion of a fluid which causes rapid decay of the substances in contact with it, but is not prepared to admit any process of actual digestion or assimilation on the part of the plant. M. Ch. Royer has also an interesting note on the cause of the sleep of plants.

SOCIETIES AND ACADEMIES

LEEDS

Naturalists' Field Club and Scientific Association, September 15.—Mr. Henry Pocklington, F.R.M.S., in the chair.—Mr. James Abbott exhibited a number of interesting plants collected in the West Riding, including *Potentilla norvegica*, which grows abundantly on the banks of the Leeds and Liverpool Canal between Armley and Kirkstall, and appears to have been thoroughly naturalised. It was first gathered about 1860, by Mr. Wm. Kirkley, but not satisfactorily determined at the time. In 1868 it was found, also apparently native, in Burwell Fen, Cambridgeshire, by Mr. G. S. Gibson, and recorded by him in the *Journal of Botany* for that year (vol. vi., p. 302; also see "Babington's Manual," seventh edition). In 1874 Mr. Abbott noticed it in great abundance, and in 1875 it was sent to Kew to be named. It turned out to be a Scandinavian form, though in what manner it reached the Leeds district is as yet unaccounted for. Mr. C. P. Hobkirk, of Huddersfield, reports that it grows on the canal banks in his neighbourhood, where he found it in 1873. Mr. Abbott also reported the capture of the Clouded Yellow Butterfly (*Colias edusa*) near Adel Dam, six miles north of Leeds, on the 5th September. This ordinarily southern form seems this year to have extended its range far to the northward. *Vanessa antiopa*, also recorded from Kirkstall Road, Leeds, in September.